UNITED STATES MARINE CORPS
MARINE CORPS AIR STATION
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STATION ORDER 4790.17

From: Commanding Officer
TO: Distribution List

Subj: HOT NICKEL CADMIUM (NICAD) BATTERY HANDLING

Ref: (a) NAVAIR 17-15 BAD-1
(b) NAVAIR 01-11OHCE-1

1. Purpose. To establish responsibilities and procedures for the recognition and handling of overheated batteries.

2. Background. The function of the NICAD battery is to provide an emergency source of power for the aircraft electrical system. Extreme care must be taken to maintain the NICAD batteries in perfect condition. Due to the dangers associated with NICAD batteries, it is imperative that all personnel coming into contact with them be aware of the dangers associated with overheated NICAD batteries and NICAD batteries in a Thermal Runaway condition. The symptoms of both conditions are virtually identical; only the cause is different. An overheated battery is caused by a short circuit in the individual battery cells. The short is usually heat induced and is characterized by a hot, smoking, and whistling battery. The Thermal Runaway condition occurs when the NICAD battery is overcharged and the excess current is passed off in the form of heat, the heat lowers the battery cell resistance, which in turn increases the current. Thus, an uncontrolled current or runaway condition is attained. If left unchecked this process may continue until an explosion occurs.

3. Action/Responsibilities. The following guidelines apply to the handling, storage, and maintenance of batteries.

a. The electrolyte is a 30% (by weight) solution of potassium hydroxide and distilled water. The neutralizing agent for this electrolyte is a boric acid solution or vinegar.

b. When a battery has been removed from an aircraft for transport to the Intermediate Maintenance Activity (IMA), care should be taken in its handling. Avoid setting the battery directly on metal shelves and concrete decks; rubber matting or wooden platforms should be provided.

c. Reference (a) contains the maintenance requirements, instructions, and safety precautions for battery charging and maintenance.

d. The following applies to the handling of **HOT BATTERIES.** As batteries are normally installed in aircraft, immediate action should encompass cooling and removal. The procedures listed in this maintenance instruction should be adhered to.

(1) If aircraft rotors are turning, direct the pilot to follow procedures (a) through (d).

a. Turn aircraft battery off.

b. Contact Crash Crew.

c. Secure aircraft engines.

d. Evacuate all unnecessary personnel from immediate vicinity of the aircraft.

(2) With aircraft secured on deck, the following procedures (a) through (f) will be adhered to:

a. If present, Crash Crew should open battery compartment. If crash crew is not present, be extremely cautious gaining access to the battery compartment.

b. If flame is present, use available extinguisher agent.

WARNING

If there is no fire, do not use CO2 extinguishing agent to cool the battery. The uses of CO2 may release static electricity which could ignite HYDROGEN/OXYGEN GASES trapped in the battery compartment.

c. If there is no flame or fire, but smoke, fumes, or electrolyte are being emitted from the battery or vent tubes, apply water to the battery or vent tubes.

d. Ensure proper ventilation if no flame, smoke, hydrogen/oxygen gases, or electrolyte are being emitted from the battery or vent tubes.

e. After battery has been removed, additional cooling may be accomplished with water.

f. After cooling, route the battery to IMA for maintenance (contact battery locker at ext. 2271). Under no circumstances will a hot battery be routed to IMA prior to cooling.

NOTE: Personnel involved in the handling of batteries will be trained in emergency procedures and properly equipped as required by reference (a). Minimum equipment required for battery handling will be as follows:

(1) Long rubber gloves.

(2) Long rubber apron.

(3) Full face shield.

(4) Coveralls/utilities.

C. J. TURNER

DISTRIBUTION: SPL
SAR (10)

From: Aircraft Maintenance Officer

Subj: HOT NICAD BATTERY HANDLING

Ref: (a) NAVAIR 17-15 BAD-1
(b) NAVAIR 01-11OHCE-1

1. Purpose: To establish responsibilities and procedures for the recognition and handling of overheated batteries.

2. Background: The function of the Nickel Cadmium (NICAD) battery is to provide an emergency source of power for the aircraft electrical system. Extreme care must be taken to maintain the NICAD batteries in perfect condition. Due to the dangers associated with NICAD batteries, it is imperative that all personnel coming into contact with them be aware of the dangers associated with overheated NICAD batteries and NICAD batteries in a Thermal Runaway condition. The symptoms of both conditions are virtually identical; only the cause is different. An overheated battery is caused by a short circuit in the individual battery cells. The short is usually heat induced and is characterized by a hot, smoking, and whistling battery. The Thermal Runaway condition occurs when the NICAD battery is overcharged and the excess current is passed off in the form of heat, the heat lowers the battery cell resistance, which in turn increases the current. Thus, an uncontrolled current or runaway condition is attained. If left unchecked this process may continue until an explosion occurs.

3. Action/Responsibilities: the following guidelines apply to the handling, storage, and maintenance of batteries.

a. The electrolyte is a 30% (by weight) solution of Potassium Hydroxide and distilled water. The neutralized agent for this electrolyte is a Boric Acid solution or vinegar.

b. When a battery has been removed from an aircraft to be routed to IMA, care should be taken in it's handling. Avoid sitting battery on metal shelves and concrete decks, rubber matting or wooden platforms should be provided.

c. Reference (a) contains the maintenance requirements, instructions, and safety precautions for battery charging and maintenance.

d. The following applies to the handling of HOT BATTERIES:

(1) As batteries are normally installed in an aircraft, immediate action should encompass cooling and removal, the procedures listed in this maintenance instruction should be adhered to.

(a) If aircraft rotors turning, request pilot follow procedures (1) through (4).

(1) Turn aircraft battery off.

(2) Contact Crash Crew.

(3) Secure aircraft engines.

(4) Evacuate all unnecessary personnel from immediate vicinity of the aircraft.

(b) With aircraft secured on deck, the following procedures (1) through (6) will be adhered to:

(1) If present, Crash Crew should open battery compartment, and if not present, be extremely cautious gaining access to the battery compartment.

(2) If flame is present, use available extinguisher agent (see warning below).

(3) If there is no flame or fire, but smoke, fumes, or electrolyte being emitted from the battery or vent tubes, apply water to the battery or vent tubes.

(4) Ensure proper ventilation if no flame, smoke,hydrogen/oxygen gases, or electrolyte are being emitted from the battery or vent tubes.

(5) After battery has been removed, additional cooling may be accomplished with water.

(6) After cooling, route the battery to the IMA for maintenance (contact battery locker at ext. 2271). Under no circumstances will a hot battery be routed to IMA prior to cooling.

WARNING
If there in no fire, do not use CO2 extinguishing agent to cool the battery. The uses of CO2 may release static electricity which could ignite HYDROGEN/OXYGEN GASES trapped in the battery compartment.

NOTE: Personnel involved in the handling of batteries will be trained in emergency procedures and properly equipped as required by reference (a). Minimum equipment required for battery handling will be as follows:

(1) Long rubber gloves
(2) Long rubber apron
(3) Full face shield
(4) Coveralls/utilities

E. W. Hanna